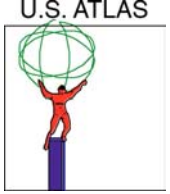
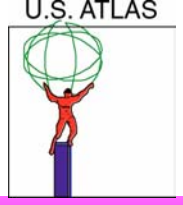


U.S. ATLAS M&O Introduction

William J. Willis
Columbia University

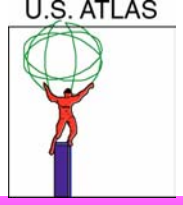


The Context: funding guidance

The "Research Program:"

- DOE Guidance of March 2002 states that one figure will be given for each year, to be applied by U.S. ATLAS Management to cover all the Research Program categories:
  - Maintenance and Operations
  - Software and Computing (SWC) (not reviewed here)
  - R&D for replacement parts required for maintenance or upgrades
  - Commissioning and Integration, as scrutinized by CERN RRB
- NSF will follow the same system, we think

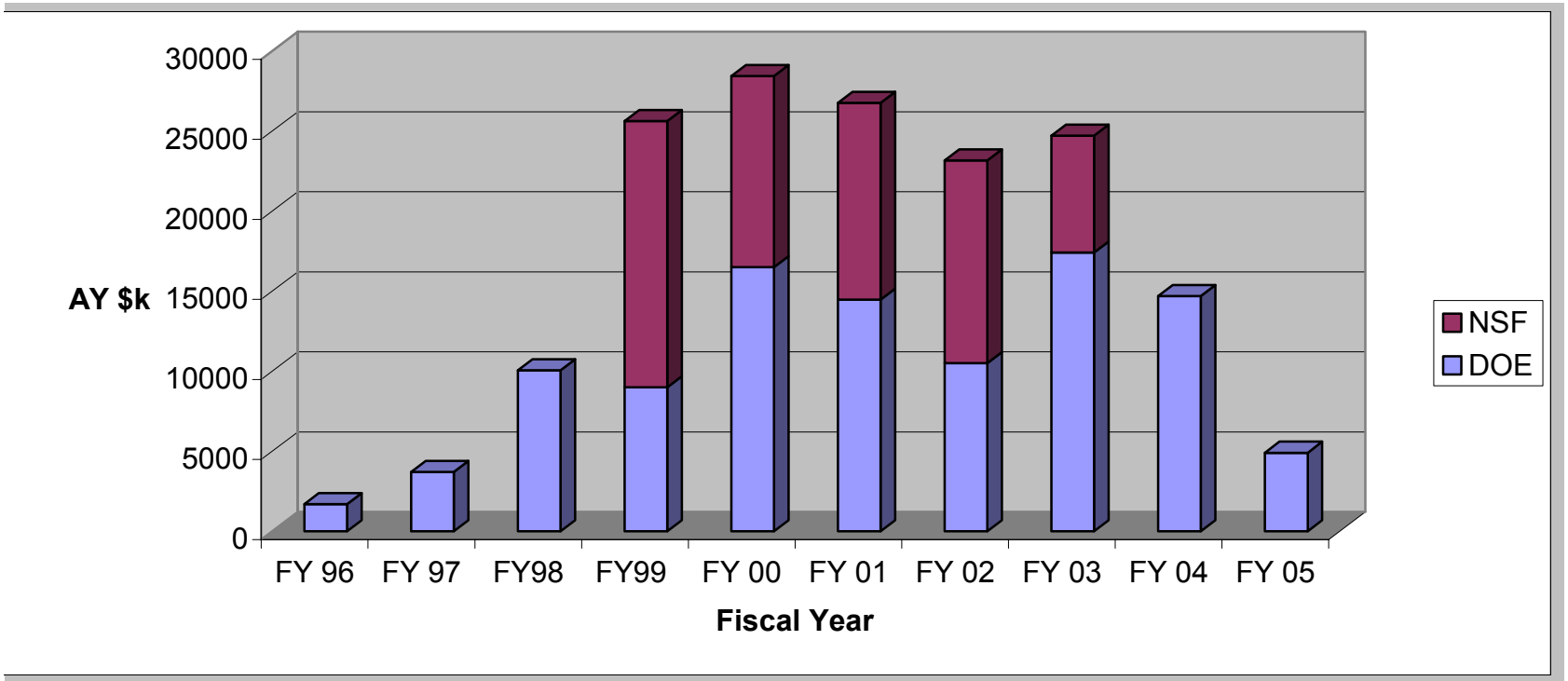
- The level of Guidance is far below the needs we had planned to present at the April M&O Review, allowing for the previous Guidance for SWC.
- A new plan had to be developed quickly, in order to evaluate the impact on the physics program
- A new plan for Software and Computing has been drafted, taking into account the latest schedule for the LHC, beams in April 2007, and used in our Tables to give a better match to the overall Research Program funding. There are still problems that we are studying.



The Physics Context: Impact on Physics

- **The priority we must give to operations in the next few years means that much of the impact will fall on Physics and Computing. It will be important to recall that:**
  - **Of all HEP projects active *or planned*, the LHC has, *by far,* the largest discovery potential for critical issues in fundamental physics**
  - **This SWC area is critical to the successful performance of the physics and to the participation of U.S. scientists**
  - **The U.S. has played an absolutely crucial role in ATLAS Computing, e.g. control/framework, infrastructure for the database**
- **We will continue to argue for better support for the Research Program**

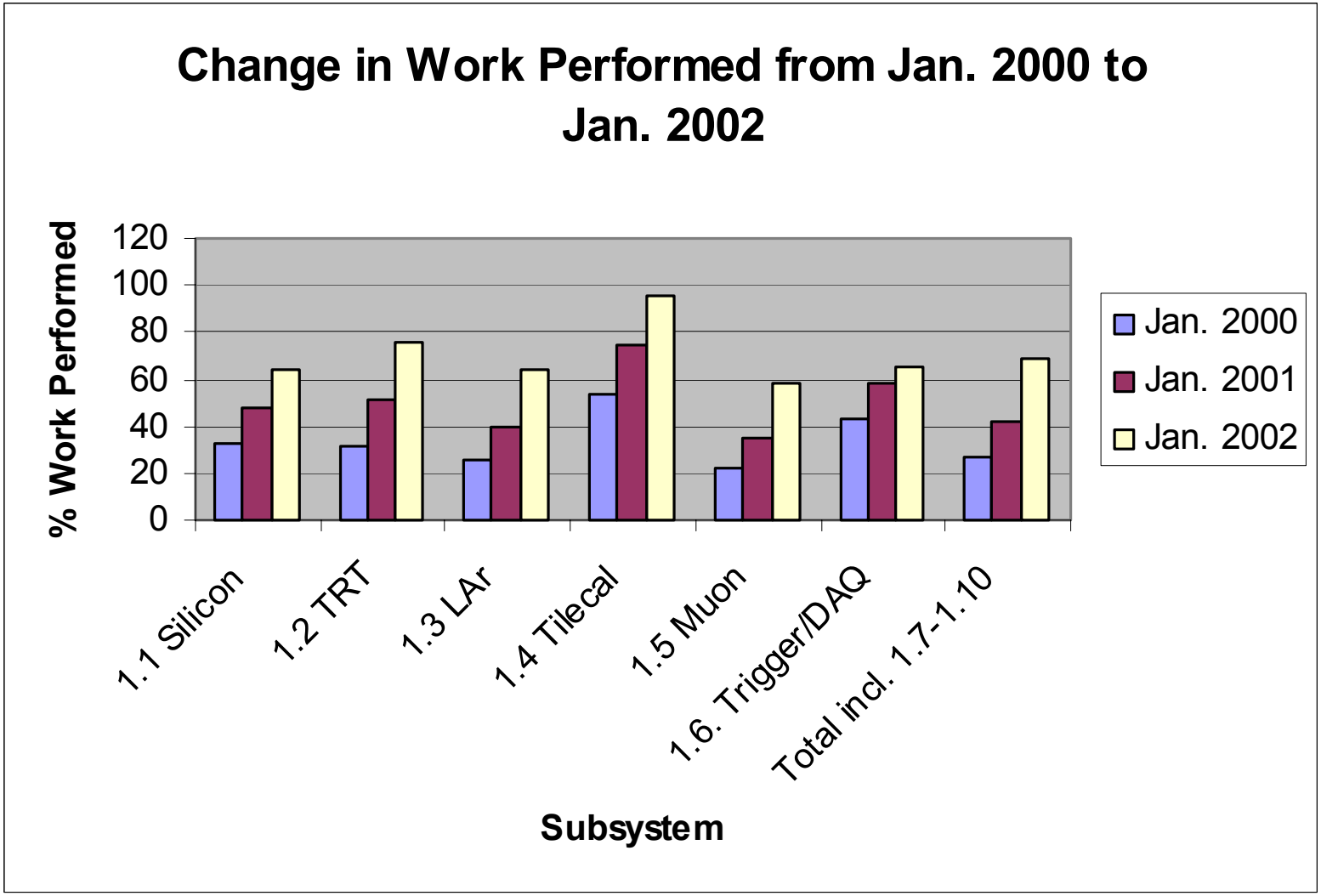
U.S. ATLAS Construction Project Funding



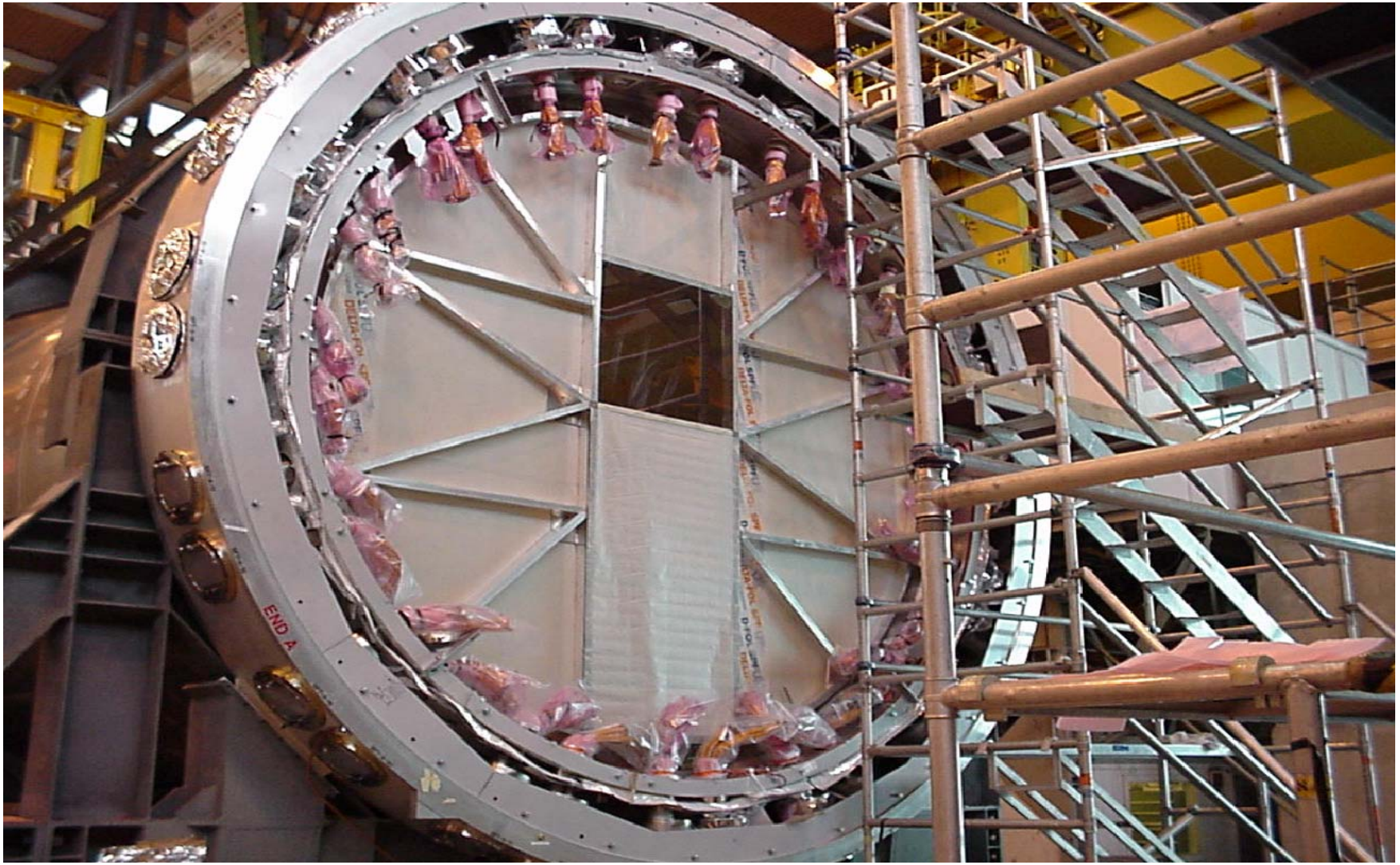
AY k$

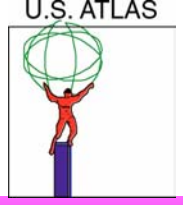
Agency	FY 96	FY 97	FY98	FY99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	Total
DOE	1700	3710	10050	8999	16494	14475	10507	17416	14690	4909	102950
NSF				16630	11940	12290	12650	7290			60800
Total	1700	3710	10050	25629	28434	26765	23157	24706	14690	4909	163750

Status of Construction



U.S. ATLAS Detector Components are at CERN – Liquid Argon Barrel Cryostat and Feedthroughs





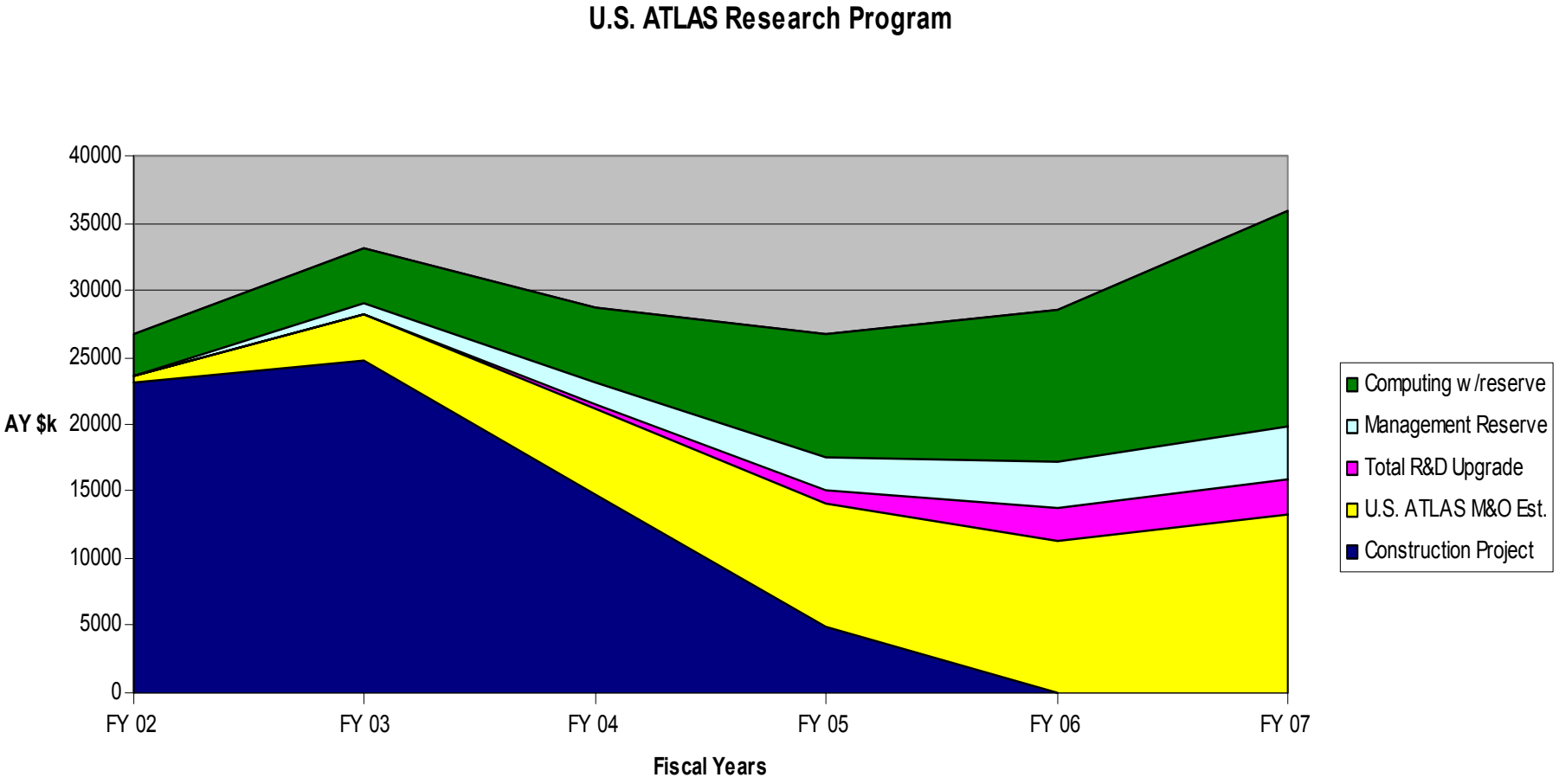
Resource Review Board Process

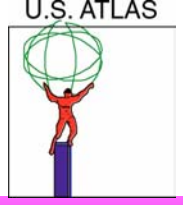
- The Funding Agencies supporting ATLAS meet in the Resource Review Board, next on April 22, to consider issues in the management and funding of the experiment
- The experiment has presented an analysis of the needs of the Maintenance and Operations, the Commissioning and Integration, the Software and Computing and the Cost to Complete the experiment.
- CERN asks for approval to share these costs among the funding agencies, and they in turn asked for a system of "scrutiny" of these items, meanwhile "approving" a portion of the 2002 M&O expenses, the remainder to be approved this month
- The U.S. is constrained by the funding cap on the Construction Project, so cannot add funding for the Cost to Complete beyond contingency, but expects to contribute to the other items, as funds allow

The U.S. ATLAS Process to determine M&O costs

- The "Common" portion (M&O Category A) was evaluated by ATLAS, scrutinized by the small RRB group (with a member from the U.S.) accepted by the RRB, including the DOE and NSF;
  - we use the difference between calendar and U.S. fiscal years to delay payment;
- The U.S. subsystems have determined what they need to carry out the M&O on the detectors that they have been responsible for
- These numbers have been reviewed twice by our Project Advisory Panel, scrubbed by our own Project Office and Engineers, and subjected to three rounds of "guidance" by our Management to reduce the totals,
- Throughout, there has been a dialog with the ATLAS Detector System Leaders to maintain consistency and to come to grips with the issue of Labor, which is not yet fully developed by ATLAS
- The Commissioning and Integration (C&I) costs have been scrutinized by the same RRB team and accepted as legitimate, but we have not included our share of them (~$2.5M 2002-2005), mainly because our needs are already so far above the agency guidance! No doubt the U.S. will be questioned on this point in the RRB

Total U.S. ATLAS Program



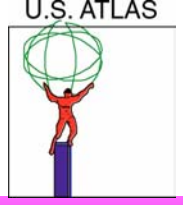


M&O and Upgrade R&D + Computing

WBS	Description	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
				AY $k			
3.0	**U. S. ATLAS M&O**	**486**	**3479**	**6469**	**9197**	**11271**	**13316**
3.1	Silicon	194	385	344	584	1671	1797
3.2	TRT		545	1326	748	445	362
3.3	Liquid Argon		212	704	1526	2020	3546
3.4	TileCal	204	943	916	1247	893	877
3.5	Muon	0	826	1908	2687	2351	1882
3.6	Trigger/DAQ		18	135	66	869	1111
3.7	Common ATLAS	88	135	287	481	848	1512
3.8	Education / Outreach		105	166	206	249	256
3.9	Project Office		308	316	1006	1038	1065
3.10	Technical Coordination		0	366	646	886	909
4.0	**U. S. ATLAS R&D Upgrade**	**0**	**0**	**249**	**925**	**2505**	**2510**
4.1	Silicon		0	249	925	1885	1913
4.2	TRT		0	0	0	0	0
4.3	Liquid Argon		0	0	0	620	597
4.4	TileCal		0	0	0	0	0
4.5	Muon		0	0	0	0	0
	Reserve @ 25% of M&O and R&D	**0**	**870**	**1679**	**2530**	**3444**	**3957**
2.0	**Computing w/reserve**	**3090**	**3982**	**5667**	**9157**	**11281**	**16049**
	Grand Total (RP Need)	**3576**	**8330**	**14065**	**21809**	**28501**	**35832**
	Construction Project	**23157**	**24706**	**14690**	**4909**		
	DOE RP Guidance @3/02	2550	3350	4400	13000	22500	23500
	NSF RP Guidance @ 60% of DOE	1530	2010	2640	7800	13500	14100
	Total Target Funding	**4080**	**5360**	**7040**	**20800**	**36000**	**37600**
	Need vs. Target	504	(2970)	(7025)	(1009)	7499	1768

Constraints on a new Plan for reduced Research Phase funding

- Our Construction Project has worked to a well-defined list of detector deliverables: large complex systems are now being delivered to CERN
- U.S. teams are starting to put these into operation *now*, since it is not possible to put systems into the relatively inaccessible experiment without sufficient operation on the surface
- These teams have the skill and knowledge to do this, there would be a serious risk to leave the equipment sitting in storage and hope to run it later, with different teams
- Consequently, this work has a high priority
- If funds are much lower than expected, other work, such as computing, must be impacted



Present Status

- The New Plan for computing represents a drastic retrenchment
- Our M&O costs have been scrutinized and scrubbed, we still fall short in the next few years
- This is based on the assumption that the NSF support is scaled to that from the DOE by the same ratio as the funding for the U.S. ATLAS Construction Project, an assumption that is not yet confirmed.
- The Plan we present is consequently a snapshot at this moment